

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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OFFICE OF THE SECRETARY

In the Matter of)
Service Rules for the 746-764 and)
776-794 MHz Bands, and)
Revisions to Part 27 of the)
Commission's Rules)

WT Docket No. 99-168

REPLY COMMENTS OF
ADAPTIVE BROADBAND CORPORATION

Adaptive Broadband Corporation ("ADAP"), by its attorneys and pursuant to Section 1.429 of the Commission's Rules, 47 C.F.R. §1.429, hereby replies to the comments filed on March 10, 2000 in the above-captioned proceeding. These comments concern the petitions filed for reconsideration of the Commission's *First Report and Order* ("Order")¹ in this docket. In its Petition for Reconsideration ("Petition"), ADAP proposed changes to the Commission's technical rules that would permit the deployment of base stations and subscriber equipment in both the 746-764 MHz and 776-794 MHz bands (the "700 MHz bands") and thus would enable the use of time-division duplexing ("TDD") technology with these frequencies. In these Reply

¹ *In Re Service Rules For the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, First Report and Order*, WT Docket No. 99-168, FCC 00-5, rel. Jan. 7, 2000.

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Comments, ADAP responds to the comments of Motorola on ADAP's Petition and the petitions of other parties interested in deploying TDD in the 700 MHz bands.²

In its comments, Motorola objects to the use of TDD technology in the 700 MHz bands for two reasons. Neither provides a valid basis for denying ADAP's Petition. *First*, Motorola contends that combining FDD and TDD technologies in the same band will increase the potential for interference into public safety operations in the adjacent bands.³ ADAP agrees that combining TDD and FDD in the same band creates more scenarios for potential interference. However, in making this argument, Motorola ignores the fact that all licensees operating in the 700 MHz bands will be required to comply with out-of-band emission ("OOBE") limits, for emissions into the public safety band, of $76 + 10 \log P$ dB for emissions from base station transmitters and $65 + 10 \log P$ dB for emissions from mobile and portable transmitters. ADAP notes that Motorola did not petition the Commission to reconsider these limits, nor did Motorola raise any objection to these limits in its most recent comments. Since all licensees must comply with these limits regardless of the technology they employ (FDD, TDD, or something else), there is no reason to believe that licensees employing TDD equipment will generate any undue interference into public safety operations.

Second, Motorola argues that combining TDD and FDD technologies in the same band will create potential interference problems between TDD and FDD systems that cannot be addressed in a reasonable manner. ADAP disagrees, as interference between TDD and FDD can be adequately addressed by setting general OOBE constraints that are strict but attainable. The general OOBE limit as adopted in the *Order* (*i.e.*, $43 + 10 \log P$ dB) is not workable. As TRW

² Petitions requesting changes to the technical rules to accommodate TDD technology were filed by TRW Inc. ("TRW"), U S West Wireless LLC ("U S West"), and ArrayComm, Inc.

³ Comments of Motorola at 12.

demonstrated in its comments, broadband interference emitted at this level into spectrum being used by another broadband system will result in a “dead zone” of significant size around the offending emitter.⁴ However, this problem can be successfully addressed by extending the OOB limits applicable to emissions into the public safety bands to apply equally as a constraint on in-band OOB.⁵ ADAP proposes that these limits apply beyond 1 MHz of the channel boundary and that the emissions mask be symmetrical on both sides of the band. This is in line with the smaller of the guardbands already established between the commercial and public safety bands. ADAP agrees with TRW that these limits will be a challenge to meet, but we believe they are achievable through use of digital signal processing, filters, reduced transmit power levels, or roll-off guardbands.⁶ Furthermore, adherence to these limits should not significantly affect equipment cost, given the existence of more stringent OOB rules for emissions into public safety bands.

Under these circumstances, there is no basis for perpetuating the rules’ inherent bias toward FDD, as Motorola effectively proposes in its comments. As the Commission recognizes in its *Order*, the public interest is served not by picking one technology over another, but by establishing an environment that gives licensees the greatest flexibility in deciding what technology to deploy.⁷ Such an environment helps ensure that the allocated spectrum is used in an efficient manner to provide services that effectively address the needs of U.S. consumers at a reasonable price.

⁴ Comments of TRW at 7.

⁵ See Comments of TRW at 8.

⁶ At the same time, receiver systems should be designed to tolerate or adjust to the level of interference received, either through channel selection, frequency hopping, or directive antennas.

⁷ See *Order* at ¶¶ 4, 15.

Both FDD and TDD have their respective strengths and weaknesses. FDD is well-suited for circuit-switched voice applications, but is less efficient for asymmetric applications such as Internet traffic and requires a large, potentially wasteful frequency duplexing separation. In contrast, TDD increases the number of potential interference scenarios to consider, but can be used effectively to meet increasing consumer demands for Internet and other broadband access services – the services of most interest to the Commission in this proceeding -- in a minimal amount of spectrum. As ADAP and others have shown in this proceeding, the FCC can create an environment in which licensees in the 700 MHz band are free to choose either FDD and TDD technology without creating undue interference into public safety or other systems by setting suitable OOB limits. The Commission set acceptable OOB limits for emissions into the public safety bands in its *Order*, and can create appropriate general OOB limits simply by applying the public safety limits to other bands. Under these circumstances, the fact that TDD can achieve higher bandwidth efficiency for many asymmetric applications without requiring a fixed and equal bandwidth allocation in each direction should not be used as an argument against it. To do so would deprive U.S. consumers of the advantages of this innovative technology without countervailing benefit.

For these reasons, the Commission should disregard the comments of Motorola in considering ADAP's Petition. ADAP urges the Commission to grant its Petition, thereby

accommodating use of TDD technology in the 700 MHz bands to the ultimate benefit of U.S. consumers.

Respectfully submitted,

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March 17, 2000

CERTIFICATE OF SERVICE

I, Pamela L. Murray, do hereby certify that copies of the foregoing "Reply Comments of Adaptive Broadband Corporation" were delivered this 17th day of March, 2000, to the following in the manner indicated:

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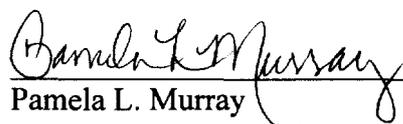
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